

Claims

1. An aqueous solution for electrodepositing tin-zinc alloys comprising the following components:

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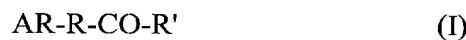
- a) Zn(II) ions;
- b) Sn(II) ions;
- c) aliphatic carboxylic acids and/or alkali salts thereof;
- d) anionic surfactants;
- e) non-ionic surfactants.

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2. A solution according to claim 1 which additionally comprises aromatic aldehydes and/or aromatic ketones.

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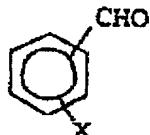
3. A solution according to claim 2 wherein the aromatic aldehydes and/or aromatic ketones have the formula (I)



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wherein AR = phenyl, naphthyl; R = CH<sub>2</sub>, CH = CH and R' = H, C<sub>1-3</sub> alkyl.

4. A solution according to claim 2, characterised in that the aromatic aldehydes have the formula (II)



(II)

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wherein X = H, CH<sub>3</sub>, OCH<sub>3</sub>, Cl, Br.

5. A solution according to claim 1, wherein the solution has a pH value of 2 – 8.

30 6. A solution according to claim 5, wherein the solution has a pH value of 3 - 5.

7. A solution according to claim 1, wherein the Sn(II) and Zn(II) ions are contained as chlorides, sulfates or alkyl sulfonates and, optionally, conducting salts of pertinent anions are also contained.

5 8. A solution according to claim 1, wherein the aliphatic carboxylic acids are hydroxy carboxylic acids and/or amino carboxylic acids or alkali salts thereof.

9. A solution according to claim 8, wherein the carboxylic acids are citric acid or alkali salts thereof.

10 10. A solution according to claim 1, wherein the non-ionic surfactants have the formula (III)



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wherein R represents an alkyl, aryl, alkylaryl radical and n = 1 – 100.

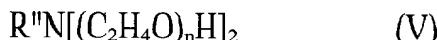
11. A solution according to claim 10, which additionally comprises non-ionic surfactants of the formula (IV)

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and/or of the formula (V)

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wherein R' = C<sub>1-3</sub> alkyl or -(C<sub>2</sub>H<sub>4</sub>)<sub>n</sub>H; R'' = C<sub>5-20</sub> alkyl and n = 1 – 100.

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12. A solution according to claim 1, wherein the anionic surfactants include one or more of the compounds of the formulae (VI) to (IX)

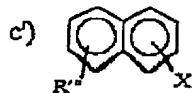


wherein R = C<sub>3-12</sub> alkyl; X = H, -SO<sub>3</sub>M; M = Na, K, NH<sub>4</sub>

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wherein  $R' = C_{3-12}$  alkyl;  $R'' = C_{2-5}$  alkyl,  $M = Na, K, NH_4$



(VIII)

5 wherein  $R''' = H, C_{1-5}$  alkyl,  $O-(C_2H_4O)_n-X$ ; or

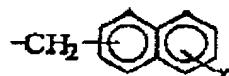


and  $X = SO_3M$  with  $M = Na, K, NH_4$



(IX)

wherein  $R''' = H, C_{1-5}$  alkyl,  $O-(C_2H_4O)_n-X$ ; or



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and  $X = SO_3M$  with  $M = Na, K, NH_4$

with  $n = 0 - 100$ , preferably  $6 - 15$

13. A solution according to claim 1, which additionally comprises aromatic  
15 and/or heterocyclic carboxylic acids or alkali salts thereof.

14. A solution according to claim 13, wherein the carboxylic acids have the  
formula (XIV)

20  $R-COOM$

(XIV)

wherein  $R =$   and  $M = H, Na, K, NH_4$